



Office of Research and Development  
National Health and Environmental Effects Research Laboratory  
**Mid-Continent Ecology Division (MED)**

**GERALD THOMAS ANKLEY**

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Mid-Continent Ecology Division - Duluth  
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(revised 01/04/02)

**EDUCATION**

| <u>Degree</u> | <u>Year</u>                                 | <u>Major</u>                             | <u>Institution</u>                            |
|---------------|---|--|---|
| Ph.D.         | 1984 - 1987                                 | Forest Resources<br>(Aquatic Toxicology) | University of Georgia<br>Athens, GA           |
| M.S.          | 1982 - 1984                                 | Forest Resources<br>(Aquatic Toxicology) | University of Georgia<br>Athens, GA           |
| B.S.          | 1979 - 1982                                 | Fisheries and Wildlife                   | Michigan State University<br>East Lansing, MI |
| -             | 1977 - 1979<br>(Transferred September 1979) | Physics<br>Rochester, MI                 | Oakland University                            |

**EXPERIENCE**

**Chief, Toxic Effects Characterization Branch**

| <u>Dates</u>   | <u>Employer</u>  |
|----------------|--|
| 2000 - Present | U.S. Environmental Protection Agency<br>Mid-Continent Ecology Division<br>Duluth, MN |

**Adjunct Professor**

| <u>Dates</u>   | <u>Employer</u>   |
|----------------|---|
| 1994 - Present | Department of Fisheries and Wildlife<br>University of Minnesota |

**Adjunct Professor**

| <u>Dates</u>   | <u>Employer</u>  |
|----------------|--|
| 1993 - Present | Department of Biology<br>Michigan Technological University |

**Senior Research Toxicologist**

| <u>Dates</u> | <u>Employer</u>  |
|--------------|--|
| 1996 - 2000  | U.S. Environmental Protection Agency<br>Mid-Continent Ecology Division<br>Duluth, MN |

**Acting Chief, Ecological Toxicology Branch**

| <u>Dates</u> | <u>Employer</u>  |
|--------------|--|
| 1995 - 1996  | U.S. Environmental Protection Agency<br>Mid-Continent Ecology Division<br>Duluth, MN |

**Research Toxicologist**

| <u>Dates</u> | <u>Employer</u>  |
|--------------|--|
| 1988 - 1995  | U.S. Environmental Protection Agency<br>Mid-Continent Ecology Division<br>Duluth, MN |

**Postdoctoral Research Associate (Joint Appointment)**

| <u>Dates</u> | <u>Employer</u>  |
|--------------|--|
| 1987 - 1988  | Department of Fisheries and Wildlife<br>Center for Environmental Toxicology<br>Michigan State University |

**Research Assistant**

| <u>Dates</u>               | <u>Employer</u>                                     |
|----------------------------|---|
| 1985 - 1987<br>1982 - 1984 | School of Forest Resources<br>University of Georgia |

**Teaching Assistant (Hydrology, Aquaculture, Fish Physiology)**

| <u>Dates</u> | <u>Employer</u>                                     |
|--------------|---|
| 1984 - 1985  | School of Forest Resources<br>University of Georgia |

## **Research Technician**

### Dates

### Employer

1982

Office of Toxic Materials Control  
Michigan Department of Natural Resources

## **Youth Conservation Corps Supervisor**

### Dates

### Employer

1980

Michigan State University  
East Lansing, MI

## **PROFESSIONAL ACTIVITIES**

### Academic Advisory Responsibilities

Paul Sibley, Postdoctoral Associate, National Research Council (NRC)  
Michael Hornung, Postdoctoral Associate, NRC  
Patrick Schoff, Postdoctoral Associate, NRC  
Sandra Harting, Doctoral Candidate, Michigan Technological University  
Ellen Lutz, Doctoral Candidate, Michigan Technological University  
Gregory Peterson, Masters Candidate, University of Minnesota  
Scott Collyard, Masters Candidate, University of Wyoming  
Randy Lehr, Masters Candidate, University of Minnesota  
Genevieve Woodward, Masters Candidate, University of Minnesota

### Member of Society of Environmental Toxicology and Chemistry (SETAC)

Member of Fellowship Awards Committee (1989 - 1991)  
Member of Technical Committee (1993 - 1998)  
Session Chair, Annual SETAC Meeting (1992, 1993, 1994, 1997, 1998, 2000)  
Session, Chair, Annual SETAC-Europe Meeting (1999)  
Member of Organizing Committee for 1995 Annual SETAC Meeting  
Special Symposia Chair, Annual SETAC Meeting (1996, 1997, 1999)

### Editorial Positions

Aquatic Toxicology Editor, Environmental Toxicology and Chemistry (1997 - Present)  
Member of Editorial Board, Environmental Toxicology and Chemistry (1989 - 1993)  
Member of Editorial Board, Chemosphere (1996 - Present)

### Journal Peer Reviews

Aquatic Toxicology  
Archives of Environmental Contamination and Toxicology  
Bulletin of Environmental Contamination and Toxicology  
Canadian Journal of Fisheries and Aquatic Sciences  
Canadian Journal of Zoology  
Chemosphere  
Critical Reviews in Toxicology  
Environmental Health Perspectives  
Environmental Pollution  
Environmental Science and Technology  
Environmental Toxicology and Chemistry  
Fish Physiology and Biochemistry  
Human and Ecological Risk Assessment  
Hydrobiologia

Journal of Applied Ecology  
Journal of Fish Biology  
Journal of Great Lakes Research  
Limnology and Oceanography  
Limnology and Oceanography  
Marine Environmental Research  
Marine Pollution Bulletin  
Science of the Total Environment  
Transactions of the American Fisheries Society  
Toxicology  
Toxicological Sciences  
Water, Air and Soil Pollution  
Water Quality Research Journal of Canada

Research Proposal Peer Reviews

California Sea Grant Program  
Michigan Sea Grant Program  
Minnesota Sea Grant Program  
Mississippi-Alabama Sea Grant Program  
Wisconsin Sea Grant Program  
Michigan Great Lakes Protection Fund  
National Oceanic and Atmospheric Administration  
National Science Foundation  
U.S. Air Force Office of Scientific Research  
U.S. EPA Exploratory Research Program  
U.S. Geological Survey  
Dutch Ministry of Science and Education and Economic Affairs  
Environment Canada  
Natural Sciences and Research Council of Canada  
Netherlands Organization for Scientific Research  
Chemical Manufacturers Association (CMA; Metal Toxicology Initiative)  
CMA/American Chemistry Council (Wildlife Research Initiative)  
Hudson River Foundation

**COMMITTEE AND CONSULTANT ACTIVITIES**

International/National Committees

Toxicity/Chemistry workgroup for Assessment and Remediation of Contaminated Sediments (ARCS)  
Program through the EPA Great Lakes National Program Office

EPA Sediment Technical Oversight Committee

Joint EPA/Army Corps of Engineers workgroup for the development of standard guidelines for assessing  
dredged materials in the Great Lakes Basin

National EPA workgroup for the development of a tiered testing/ranking strategy for contaminated  
sediments

National EPA workgroup for the development and validation of numerical sediment quality criteria

Joint EPA/Army Corps of Engineers workgroup for the development of national guidelines for the  
assessment of freshwater dredged materials

Environment Canada subcommittee for development of guidelines on collection, storage and manipulation of whole sediment, pore water, elutriates and solvent extracts of sediment for toxicity testing and chemical characterization

National multi-agency workgroup for the development of standardized toxicity and bioaccumulation test methods for freshwater sediments

Environment Canada subcommittee for the development of standard sediment test methods for *Hyaella azteca*

Environment Canada subcommittee for the development of standard sediment test methods for *Chironomus tentans* and *C. riparius*

National EPA/ORD committee for human health and ecological effects research on endocrine-disrupting chemicals

National EPA/OPPTS committee on the development and standardization of screening methods for endocrine-disrupting chemicals

National EPA/NHEERL Technical Qualifications Board (TQB) for GS14/15 promotions

World Health Organization/United Nations Environmental Program (WHO/UNEP) review panel for document on environmental effects of ozone depletion

WHO/UNEP expert writing team for global assessment of human health and ecological risks of endocrine-disrupting chemicals

European Union (EU)/EPA committee for developing and coordinating joint endocrine disruptor research

Office of Economic Cooperation and Development (OECD) Validation Management Group for Ecotoxicological Test Methods

Expert peer review panel for Moira River risk assessment conducted by Ontario Ministry of the Environment

#### International/National Workshops and Symposia

Use of Biocriteria for Regulatory Purposes, Minneapolis, MN (Invited Participant)

Application of Toxicity Identification Evaluation Procedures to Contaminated Sediments, Chicago, IL (Organizer)

Development of Biological Sediment Criteria, Burlington, Ontario, Canada (Invited Participant)

OECD Workshop for the Development of Criteria and Assessment Techniques for Contaminated Sediments, Copenhagen, Denmark (Organizer, Chair)

Contaminated Sediment Assessment Methods Workshop, Narragansett, RI (Invited Participant)

Evaluation of Contaminated Sediment Impacts on Aquatic Ecosystems, Sydney, Australia (Invited Participant)

Interpretation and Application of Biological Sediment Criteria, Burlington, Ontario, Canada (Invited Participant)

Briefing to the EPA Science Advisory Board on Equilibrium Partitioning for Deriving Sediment Quality Criteria, Washington, DC (Invited Participant)

Development of a Tiered Testing Framework for Assessing Contaminated Sediments, Washington, DC (Organizer, Chair)

Aquatic Life Criteria for Metals, Washington, DC (Invited Participant)

EMAP Indicators Workshop for the St. Louis River IJC Area of Concern, Duluth, MN (Invited Participant)

Briefing to the EPA Science Advisory Board on Bioaccumulation Assessment Methods for Dredged Material, Washington, DC (Invited Participant)

EPA Program-Specific Statistical Methods for Sediment Toxicity and Bioaccumulation Tests, Washington, DC (Organizer)

Development of a Ranking System for the EPA National Sediment Inventory, Washington, DC (Invited Participant, Workgroup Chair)

Development of Remedial Strategies for PAH-Contaminated Sediments in the St. Louis Harbor, Duluth, MN (Invited Participant)

Utility of AVS/EqP in Hazardous Waste Site Evaluations, Woods Hole, MA (Invited Participant)

Briefing to the EPA Science Advisory Board on the Development of Sediment Quality Criteria for Metals, Arlington, VA (Invited Participant)

Endocrine Disruptor Research Needs Workshop, Raleigh, NC (Organizer)

Sediment Risk Assessment Workshop (SETAC Pellston Series), Monterey, CA (Invited Participant)

Ecological Effects of Endocrine Disruptors, Duluth, MN (Organizer, Chair)

Conference on Sustainable Development and Mining in the Lake Superior Watershed, Houghton, MI (Invited Participant)

Reassessment of Metals Criteria for Aquatic Life Protection (SETAC Pellston Series), Pensacola, FL (Invited Participant)

Principles and Processes for Evaluating Endocrine Disruption in Wildlife, Kiawah Island, SC (Invited Participant, Workgroup Chair)

Evaluation of Pesticides in the Toxicity Identification Evaluation Process (NorCal SETAC Special Workshop), Sacramento, CA (Invited Participant)

Workshop on Amphibian Deformities in the Central/Midwestern US, Duluth, MN (Organizer)

IBC International Congress on Endocrine Disruptors, Washington, DC (Invited Participant)

Endocrine Issues Coalition Workshop (Chemical Manufacturers Association), Washington, DC, (Invited Participant)

SETAC Special Symposium on Endocrine Disruptors, Washington, DC (Organizer Chair)

Workshop on Screening Methods for Endocrine Disruptors in Wildlife, Kansas City, MO (Organizer Chair)

SETAC-Europe/OECD/EC Expert Workshop on Endocrine Modulators and Wildlife-Assessment and Testing, Veldhoven, The Netherlands (Invited Participant, Workgroup Chair)

SETAC-Europe Discussion Panel on Endocrine Disruptors in the Environment, Amsterdam, The Netherlands (Invited Participant)

Reproductive and Developmental Effects of Contaminants in Oviparous Vertebrates: Mechanisms, Ecological Consequences and Assessment of Risk (SETAC Pellston Series), Butte, MT (Invited Participant, Workgroup Chair)

Endocrine Modulators and Wildlife: Summary of Workshop on Assessment and Testing, Brussels, Belgium (Invited Participant)

SETAC Special Symposium on Deformed Amphibians, San Francisco, CA (Organizer Chair)

SETAC-Europe/SETAC-North America Workshop on Screening Methods for Endocrine-Disrupting Chemicals in Invertebrates, London, UK (Organizer)

Re-evaluation of the State of the Science for Water Quality Criteria Development (SETAC Pellston Series), Butte, MN (Invited Participant)

OECD Expert Consultation on Validation of Endocrine Disruptor Screening and Testing Methods, Washington, DC (Invited Participant)

Briefing to the EPA Science Advisory Board/Panel on Wildlife Screening Methods for Endocrine-Disrupting Chemicals, Washington, DC (Invited Participant)

Society of Toxicology (SOT) Symposium on Test Methods for Endocrine-Disrupting Chemicals, New Orleans, LA (Invited Participant)

EU/EPA Workshop on Joint Endocrine Disruptor Research Needs, Ispra, Italy (Invited Participant)

EPA Workshop on Toxicological Extrapolation Across Species, Research Triangle Park, NC (Organizer)

SETAC Special Symposium on Screening Approaches and Issues for Endocrine-Disruptors in Wildlife, Philadelphia, PA (Organizer)

OECD Expert Consultation on Fish Models for Testing Endocrine-Disrupting Substances, Tokyo, Japan (Invited Participant)

International Workshop on Quantitative Structure Activity Relationships in Environmental Sciences, Bourgas, Bulgaria (Scientific Committee)

Interagency Coordinating Committee for the Validation of Alternative Methods (ICCVAM) Expert Panel Meeting on the Frog Embryo Teratogenesis Assay-*Xenopus* FETAX Research Triangle Park, NC (Invited Participant)

WHO Workshop on the Development of Causal Criteria for the Effects of Endocrine-Disrupting Chemicals, San Francisco, CA (Invited Participant, Chair)

OECD Expert Consultation on Amphibian Testing, Paris France (Invited Participant, Chair)

## AWARDS AND HONORS

|             |  |
|-------------|--|
| 1977        | Oakland University Honors College  |
| 1981        | Phi Kappa Phi Honor Society-Michigan Chapter   |
| 1981        | Golden Key Honor Society   |
| 1982        | Graduated with High Honors from Michigan State University  |
| 1984        | Gamma Sigma Delta Honor Society  |
| 1984 - 1987 | University-wide research assistantship award and additional stipend  |
| 1986        | Honorable Mention for Best Student Paper at Annual AFS Meeting   |
| 1987        | Who's Who Among Students in American Universities and Colleges   |
| 1987        | The National Deans List  |
| 1987        | Phi Kappa Phi Honor Society-Georgia Chapter  |
| 1988        | Men of Achievement Listing   |
| 1989        | Sigma Xi Scientific Research Society   |
| 1989 - 1998 | Ten Annual Superior Performance Awards (award category terminated in 1998)   |
| 1992        | Science and Technological Achievement Award (STAA) for journal article on toxicity identification evaluation (selected via external peer review process by EPA Science Advisory Board)   |
| 1992        | Bronze Medal for work in the development of sediment quality criteria  |
| 1993        | STAA for journal article on metal bioavailability in sediments   |
| 1993        | Award for TCDD Ecological Risk Assessment Document   |
| 1994        | STAA for journal articles on PCB exposure and toxicity assessment in birds   |
| 1994        | Men and Women in Science listing   |
| 1994        | Bronze Medal for development of assessment methods for dredged materials   |
| 1995        | STAA for journal article on factors affecting sediment toxicity  |
| 1995 - 2000 | Who's Who in Science and Engineering   |
| 1995        | Bronze Medal for development of test methods for Great Lakes sediments   |
| 1995        | Science Track Promotion (GS14) through external (Technical Qualifications Board; TQB) peer review process  |
| 1995        | SETAC Award for Organizing Committee of 1996 Annual Meeting  |
| 1997        | STAA for journal article on phototoxicity of aromatic hydrocarbons   |
| 1997        | STAA for journal article on model for PCB bioaccumulation by tree swallows   |
| 1998        | Science Track Promotion (GS15) through external (TQB) process  |
| 1998        | Bronze Medal for methods for assessing ecological risk of metals in sediments  |
| 1998 - 2001 | Eleven EPA awards in recognition of different aspects of leadership, scientific planning and contributions to specific research projects   |
| 1999        | STAA for journal articles on sediment quality criteria for metals  |
| 1999        | STAA for journal articles on sources of phototoxicity in sediments   |
| 2000        | Special Recognition Award from National Society to Technical Writers for book entitled "Linkage of Effects to Tissue Residues: Development of a Comprehensive Database for Aquatic Organisms Exposed to Organic and Inorganic Chemicals" |
| 2000        | Manuscript nominated for best paper in 2000 volume of North America Journal of Aquaculture   |
| 2001        | STAA for journal article on application of FETAX to malformed amphibian research   |
| 2001        | STAA for journal article on spectral influences on phototoxicity of PAHs   |
| 2001        | STAA for journal articles on development and application of chronic sediment test with <i>Chironomus tentans</i>   |

## PUBLICATIONS

### Journal Articles

Ankley, G.T., R.E. Reinert, A.E. Wade and R.A. White. 1985. Temperature compensation in the hepatic mixed-function oxidase system of bluegill. *Comp. Biochem. Physiol.* 81C, 125-129.



- Ankley, G.T., V.S. Blazer, R.E. Reinert and M. Agosin. 1986. Effects of Aroclor 1254 on cytochrome P-450-dependent monooxygenase, glutathione S-transferase, and UDP-glucuronosyltransferase activities in channel catfish liver. *Aquat. Toxicol.* 9, 91-103.
- Agosin, M. and G.T. Ankley. 1987. Conversion of N,N-dimethylaniline to N,N-dimethylaniline-N-oxide by a cytosolic flavin-containing enzyme from *Trypanosoma cruzi*. *Drug Metab. Dispos.* 15, 200-203.
- Ankley, G.T., R.E. Reinert, R.T. Mayer, M.D. Burke and M. Agosin. 1987. Metabolism of alkoxyphenoxazones by channel catfish liver microsomes: Effects of phenobarbital, Aroclor 1254 and 3-methylcholanthrene. *Biochem. Pharmacol.* 36, 1379-1381.
- Ankley, G.T. and M. Agosin. 1987. Comparative aspects of hepatic UDP-glucuronosyltransferases and glutathione S-transferases in bluegill and channel catfish. *Comp. Biochem. Physiol.* 87B, 671-674.
- Ankley, G.T. and M. Agosin. 1987. Effects of diet on PCB-induced changes in xenobiotic metabolism in the liver of channel catfish (*Ictalurus punctatus*). *Can. J. Fish. Aquat. Sci.* 46, 1141-1146.
- Ankley, G.T. and R.E. Reinert. 1988. Effects of commercial versus synthetic diets on xenobiotic-metabolizing enzymes in channel catfish. *Mar. Environ. Res.* 24, 41-44.
- Ankley, G.T., V.S. Blazer, S.M. Plakas and R.E. Reinert. 1989. Dietary lipid as a factor modulating xenobiotic metabolism in channel catfish (*Ictalurus punctatus*). *Can. J. Fish. Aquat. Sci.* 46, 1141-1146.
- Ankley, G.T., R.A. Hoke, J.P. Giesy and P.V. Winger. 1989. Evaluation of the toxicity of marine sediments and dredge spoils with the Microtox<sup>®</sup> bioassay. *Chemosphere* 18, 2069-2075.
- Ankley, G.T., D.E. Tillitt, J.W. Gooch and J.P. Giesy. 1989. Hepatic enzyme systems as biochemical indicators of the effects of contaminants on reproduction of chinook salmon (*Oncorhynchus tshawytscha*). *Comp. Biochem. Physiol.* 94C, 235-242.
- Ankley, G.T., D.E. Tillitt and J.P. Giesy. 1989. Maternal transfer of bioactive polychlorinated aromatic hydrocarbons in spawning chinook salmon (*Oncorhynchus tshawytscha*). *Mar. Environ. Res.* 28, 231-234.
- Blazer, V.S., G.T. Ankley and D.L. Finco-Kent. 1989. Dietary influences on disease resistance factors in channel catfish. *Dev. Comp. Immunol.* 13, 43-48.
- Burkhard, L.P. and G.T. Ankley. 1989. Identifying toxicants: NETAC's toxicity-based approach. *Environ. Sci. Technol.* 23, 1438-1443. (Feature Article)
- Tillitt, D.E., G.T. Ankley and J.P. Giesy. 1989. Planar chlorinated hydrocarbons (PCHs) in colonial fish-eating waterbird eggs from the Great Lakes. *Mar. Environ. Res.* 28, 505-508.
- Ankley, G.T., A. Katko and J.W. Arthur. 1990. Identification of ammonia as an important sediment-associated toxicant in the lower Fox River and Green Bay, Wisconsin. *Environ. Toxicol. Chem.* 9, 313-322.
- Ankley, G.T., G.S. Peterson, J.R. Amato and J.J. Jensen. 1990. Evaluation of sucrose as an alternative to sodium chloride in the Microtox<sup>®</sup> assay: Comparison to fish and cladoceran tests with freshwater effluents. *Environ. Toxicol. Chem.* 9, 1305-1310.
- Ankley, G.T., M.T. Lukasewycz, G.S. Peterson and D.A. Jensen. 1990. Behavior of surfactants in toxicity identification evaluations. *Chemosphere* 21, 3-12.
- Hoke, R.A., J.P. Giesy, G.T. Ankley, J.L. Newsted and J.R. Adams. 1990. Toxicity of sediments from Western Lake Erie and Maumee River at Toledo, Ohio, 1987: Implications for current dredged material disposal practices. *J. Great Lakes Res.* 16, 457-470.

- Kuehl, D.W., G.T. Ankley, L.P. Burkhard and D.A. Jensen. 1990. Bioassay directed characterization of the acute toxicity of a creosote leachate. *Hazard. Waste Hazard. Mater.* 7, 283-291.
- Ankley, G.T., J.R. Dierkes, D.A. Jensen and G.S. Peterson. 1991. Piperonyl butoxide as a tool in aquatic toxicological research with organophosphate insecticides. *Ecotoxicol. Environ. Saf.* 21, 266-274.
- Ankley, G.T., G.L. Phipps, E.N. Leonard, D.A. Benoit, V.R. Mattson, P.A. Kosian, A.M. Cotter, J.R. Dierkes, D.J. Hansen and J.D. Mahony. 1991. Acid volatile sulfide as a factor mediating cadmium and nickel bioavailability in contaminated sediments. *Environ. Toxicol. Chem.* 10, 1299-1307.
- Ankley, G.T., M.K. Schubauer-Berigan and J.R. Dierkes. 1991. Predicting the toxicity of bulk sediments to aquatic organisms with aqueous test fractions: Pore water versus elutriate. *Environ. Toxicol. Chem.* 10, 1359-1366.
- Ankley, G.T., D.E. Tillitt, J.P. Giesy, P.D. Jones and D.A. Verbrugge. 1991. Bioassay-derived 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents (TCDD-EQ) in PCB-containing extracts from the flesh and eggs of Lake Michigan chinook salmon and possible implications for reproduction. *Can. J. Fish. Aquat. Sci.* 48, 1685-1690.
- Norberg-King, T.J., E.J. Durhan, G.T. Ankley and E. Robert. 1991. Application of toxicity identification evaluation procedures to the ambient waters of the Colusa Basin Drain, California. *Environ. Toxicol. Chem.* 10, 891-900.
- Schubauer-Berigan, M.K. and G.T. Ankley. 1991. The contribution of ammonia, metals and nonpolar organic compounds to the toxicity of sediment interstitial water from an Illinois River tributary. *Environ. Toxicol. Chem.* 10, 925-940.
- Tillitt, D.E., J.P. Giesy and G.T. Ankley. 1991. Characterization studies of the H4IIE rat hepatoma cell bioassay for use in the analysis of planar halogenated hydrocarbons (PHHs) in environmental samples. *Environ. Sci. Technol.* 25, 87-92.
- Tillitt, D.E., G.T. Ankley, D.A. Verbrugge, J.P. Giesy, J.P. Ludwig and T.J. Kubiak. 1991. H4IIE rat hepatoma cell bioassay-derived 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents (TCDD-EQ) in colonial fish eating waterbird eggs from the Great Lakes. *Arch. Environ. Contam. Toxicol.* 21, 91-101.
- Amato, J.R., D.I. Mount, E.J. Durhan, M.T. Lukasewycz, G.T. Ankley and E.D. Robert. 1992. An example of the identification of diazinon as a primary toxicant in an effluent. *Environ. Toxicol. Chem.* 11, 209-216.
- Ankley, G.T. and L.P. Burkhard. 1992. Identification of surfactants as toxicants in a primary effluent. *Environ. Toxicol. Chem.* 11, 1235-1248.
- Ankley, G.T., M.K. Schubauer-Berigan and R.A. Hoke. 1992. Use of toxicity identification evaluation techniques to identify dredged material disposal options: A proposed approach. *Environ. Manage.* 16, 1-6.
- Ankley, G.T., P.M. Cook, A.R. Carlson, D.J. Call, J.A. Swenson, H.F. Corcoran and R.A. Hoke. 1992. Bioaccumulation of PCBs from sediments by oligochaetes and fishes: Comparison of laboratory and field studies. *Can. J. Fish. Aquat. Sci.* 49, 2080-2085.
- Ankley, G.T., K. Lodge, D.J. Call, M.D. Balcer, L.T. Brooke, P.M. Cook, R.G. Kreis, A.R. Carlson, R.D. Johnson, G.J. Niemi, R.A. Hoke, C.W. West, J.P. Giesy, P.D. Jones and Z.C. Fuying. 1992. Integrated assessment of contaminated sediments in the lower Fox River and Green Bay, Wisconsin. *Ecotoxicol. Environ. Saf.* 23, 46-63.
- Di Toro, D.M., J.D. Mahony, D.J. Hansen, K.J. Scott, A.R. Carlson and G.T. Ankley. 1992. Acid volatile sulfide predicts the acute toxicity of cadmium and nickel in sediments. *Environ. Sci. Technol.* 26, 96-101.
- Doerger, J.U., J.R. Meier, R.A. Dobbs, R.D. Johnson and G.T. Ankley. 1992. Toxicity reduction evaluation at a municipal wastewater treatment plant using mutagenicity as an endpoint. *Arch. Environ. Contam. Toxicol.* 22, 384-388.

- Tillitt, D.E., G.T. Ankley, J.P. Giesy, J.P. Ludwig, H. Kurita, D.V. Weseloh, C.A. Bishop, J. Larson and T.J. Kubiak. 1992. PCB residues and egg mortality in double crested cormorants from the Great Lakes. *Environ. Toxicol. Chem.* 11, 1281-1288.
- Williams, L.L., J.P. Giesy, N. DeGalan, D.A. Verbrugge, D.E. Tillitt, G.T. Ankley and R.L. Welch. 1992. Prediction of concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents from total concentrations of PCB in fish filets. *Environ. Sci. Technol.* 26, 1151-1159.
- Ankley, G.T., D.A. Benoit, R.A. Hoke, E.N. Leonard, C.W. West, G.L. Phipps, V.R. Mattson and L.A. Anderson. 1993. Development and evaluation of test methods for benthic invertebrates and sediments: Effects of flow rate and feeding on water quality and exposure conditions. *Arch. Environ. Contam. Toxicol.* 25, 12-19.
- Ankley, G.T., V.R. Mattson, E.N. Leonard, C.W. West and J.L. Bennett. 1993. Predicting the acute toxicity of copper in freshwater sediments: Evaluation of the role of acid volatile sulfide. *Environ. Toxicol. Chem.* 12, 315-320.
- Ankley, G.T., G.J. Niemi, K.B. Lodge, H.J. Harris, D.L. Beaver, D.E. Tillitt, T.R. Schwartz, J.P. Giesy, P.D. Jones and C. Hagley. 1993. Uptake of planar polychlorinated biphenyls and 2,3,7,8-substituted polychlorinated dibenzofurans and dibenzo-p-dioxins by birds nesting in the lower Fox River/Green Bay, Wisconsin. *Arch. Environ. Contam. Toxicol.* 24, 332-344.
- Benoit, D.A., G.L. Phipps and G.T. Ankley. 1993. A sediment testing intermittent renewal system for the automated renewal of overlying water in toxicity tests with contaminated sediments. *Water Res.* 27, 1403-1412.
- Harris, H.J., T.C. Erdman, G.T. Ankley and K.B. Lodge. 1993. Measures of reproductive success and PCB residues in eggs and chicks of Forster's tern on Green Bay, Lake Michigan - 1988. *Arch. Environ. Contam. Toxicol.* 25, 304-314.
- Jones, P.D., G.T. Ankley, D.A. Best, R. Crawford, N. DeGalan, J.P. Giesy, T.J. Kubiak, J.P. Ludwig, J.L. Newsted, D.E. Tillitt and D.A. Verbrugge. 1993. Biomagnification of bioassay-derived 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents. *Chemosphere* 26, 1203-1212.
- Jones, P.D., J.P. Giesy, K.B. Lodge, G.T. Ankley, D.E. Tillitt, J.L. Newsted and D.A. Verbrugge. 1993. Determination of 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents in tissues of birds at Green Bay, Wisconsin, USA. *Arch. Environ. Contam. Toxicol.* 24, 345-354.
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### Book Chapters

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## **INVITED PRESENTATIONS AND SEMINARS**

Effects of nutrition on xenobiotic metabolism in the channel catfish. Department of Biology, University of South Alabama, Mobile, AL.

Xenobiotic metabolism in fishes. EPA, Athens, GA.

Effects of commercial versus semipurified diets on Aroclor 1254-induced changes in hepatic xenobiotic-metabolizing enzymes in channel catfish. 4th International Symposium on responses of Marine Organisms to Pollutants, Woods Hole, MA.

Dietary lipid as a factor influencing the metabolism and toxicity of xenobiotics in channel catfish. FHS/AFS International Fish Health Conference, Vancouver, British Columbia, Canada.

Toxicity of sediments from the Fox River and Green Bay, Lake Michigan. Annual Meeting of the Midwest State Pollution Control Biologists, Chicago, IL.

Sediment toxicity and related issues: An overview of research at the EPA-Duluth laboratory. Natural Resources Research Institute, University of Minnesota-Duluth, Duluth, MN.

Maternal transfer of bioactive polychlorinated aromatic hydrocarbons in spawning chinook salmon (*Oncorhynchus tshawytscha*). 5th International Symposium on Responses of Marine Organisms to Pollutants, Plymouth, England.

Identification of ammonia as an important toxicant in sediment pore water in the lower Fox River and Green Bay, Annual Meeting of the International Association for Great Lakes Research, Madison, WI.

Factors influencing xenobiotic metabolism in fishes and toxicological implications. Department of Biology, Michigan Technological University, Houghton, MI.

Multiple toxicants in complex effluents: Implications for toxicity identification evaluations. 14th Annual ASTM Symposium on Aquatic Toxicology and Risk Assessment, San Francisco, CA.

The role of acid volatile sulfide in determining cadmium bioavailability in freshwater sediments: Laboratory and field studies. Annual Meeting of the Midwest Pollution Control Biologists, Chicago, IL.

Application of toxicity identification evaluation procedures to contaminated sediments: Case studies. EPA, Athens, GA.

Contaminants in aquatic environments: Sources, fates and effects. Envirovet Program, University of Wisconsin-Superior, Superior, WI.

Regulatory focuses in aquatic toxicology. Envirovet Program, University of Wisconsin-Superior, Superior, WI.

Background and technical basis for the development of sediment quality criteria by the U.S. Environmental Protection Agency. Annual Seminar of the Centre for Environmental Toxicology, Sydney, Australia (Keynote Address)

Application of toxicity identification evaluation procedures to acutely toxic sediments. Annual seminar of the Centre for Environmental Toxicology, Sydney, Australia.

Development of sediment quality criteria by the U.S. EPA. Alligator River Region Research Institute, Jabiru, Australia.

Uptake of planar PCBs and 2,3,7,8-substituted PCDFs and PCDDs by birds nesting in the lower Fox River/Green Bay, WI. 13th Annual SETAC Meeting, Cincinnati, OH.

An overview of the application of toxicity identification evaluation procedures to contaminated sediments. 1st International Symposium on Sediment Quality Assessment. Goteborg, Sweden (Keynote Address)

Phototoxicity of polycyclic aromatic hydrocarbons at varying light intensities. 15th Annual SETAC Meeting. Denver, CO.

Development of toxicity identification evaluation techniques for contaminated sediments. U.S. Fish and Wildlife Service, Columbia, MO.

Phototoxicity in assessment of ecological risk of polycyclic aromatic hydrocarbons. Department of Environmental Toxicology, University of California-Davis, Davis, CA.

Evaluation of the phototoxicity of polycyclic aromatic hydrocarbons in ecological risk assessments. Department of Civil and Environmental Engineering, Michigan Technological University, Houghton, MI.

Extrapolation of biological measurement endpoints from the laboratory to the field: A contaminated sediment perspective. Sediment Risk Assessment Forum (SETAC Pellston Series), Monterey, CA.

Predicting metal bioavailability in aquatic sediments: Current state-of-the-art. Conference on Sustainable Development and mining in the Lake Superior Watershed, Houghton, MI.

Bioavailability of metals in sediments: Technical basis of sediment quality criteria for metals. DuPont Haskell Laboratory for Toxicology and Industrial Medicine, Newark, DE.

Endocrine disruptor research by EPA. Lions Club, Two Harbors, MN.

Methods for evaluating the toxicity of sediment-associated contaminants. Pollution impacts on Aquatic Systems Course, Department of Fisheries and Wildlife, University of Minnesota, St. Paul, MN.

Predicting the toxicity of nonionic organic pesticides in sediments. NorCal SETAC Pesticide Symposium, Sacramento, CA.

Addressing the ecological risk of phototoxic chemicals. NBS Seminar Series, Columbia, MO.

Development of a research strategy for assessing the ecological risk of endocrine disruptors. 17th Annual SETAC Meeting, Washington, DC.

Reproductive toxicity of environmental endocrine disruptors in fish. IBC International Congress on Endocrine Disruptors, Washington, DC.

Assessing the risk of environmental endocrine disruptors: An overview of activities of the Office of Research and Development of the U.S. Environmental Protection Agency. 7th Annual Meeting of SETAC-Europe, Amsterdam, The Netherlands.

Endocrine-disrupting chemicals: US EPA research directions. Department of Biology, University of Minnesota-Duluth, Duluth, MN.

Effects of methoprene and ultraviolet light on the survival and development of amphibians. EPA, Research Triangle Park, NC

UV-B radiation: A research update on human and ecological health effects. EPA, Washington, DC.

EPA research on malformed amphibians. Lions Club, Two Harbors, MN.

Endocrine disruptors: Definition and research needs. Envirovet Program, University of Minnesota-Duluth, Duluth, MN.

Screening methods for endocrine disrupting chemicals in wildlife. Society of Toxicology, Continuing Education Program, New Orleans, LA.

Amphibian malformations in North America: Evaluation of the role of ultraviolet light. Department of Zoology, Michigan State University, East Lansing, MI.

Risk assessment models for phototoxic polycyclic aromatic hydrocarbons. 9th Annual Meeting of SETAC-Europe, Leipzig, Germany.

Endocrine-disrupting chemicals in the environment: Assessing potential effects in wildlife. 22nd Midwest Environmental Chemistry Workshop, Houghton, MI.

Current EPA research for endocrine-disrupting chemicals in wildlife. Dow Chemical Company, Midland, MI.

Ultraviolet radiation: A contributor to adverse effects in amphibians? Department of Biology, University of Minnesota-Duluth, Duluth, MN.

Small fish models for assessing reproductive toxicants: Evaluation of the fathead minnow. OECD Expert Consultation, Tokyo, Japan.

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Identifying endocrine-disrupting chemicals: Development of models with fish and amphibians. Toxicology and Environmental Health Seminar Series, University of Florida, Gainesville, FL.

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Endocrine disruptors in fish and wildlife: An overview of the issue and related research at the Duluth EPA laboratory, Department of Fisheries and Wildlife, University of Minnesota, St. Paul, MN.

Development of causal relationships for the effects of toxic chemicals on wildlife. WHO Meeting, San Francisco, CA.

Effects of endocrine-disrupting chemicals on humans and wildlife. University for Seniors, University of Minnesota-Duluth, Duluth, MN.

Identification of endocrine disruptors using a short-term reproduction assay with the fathead minnow, 22nd Annual SETAC Meeting, Baltimore, MD.

Probabilistic risk assessment for the effects of solar ultraviolet radiation on amphibians, 22nd Annual SETAC Meeting, Baltimore, MD.

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Dierkes, J.R., M.K. Schubauer-Berigan, S. Baker and G.T. Ankley. 1991. The role of pH in evaluating the toxicity of cationic metals in toxicity identification evaluations. 12th Annual SETAC Meeting, Seattle, WA.

Hoke, R.A., A.M. Cotter, P.A. Kosian, G.T. Ankley and G.L. Phipps. 1991. Evaluation of equilibrium partitioning theory for predicting acute toxicity of field-collected, DDT-contaminated sediments to the amphipod, *Hyalella azteca*. 12th Annual SETAC Meeting, Seattle, WA.

Jones, P.D., J.L. Newsted, J.P. Giesy, D.A. Verbrugge, D.E. Tillitt, G.T. Ankley, T.J. Kubiak, D.A. Best, J.P. Ludwig and M.E. Ludwig. 1991. Alterations in the biological potency of environmental planar chlorinated hydrocarbon extracts. 12th Annual SETAC Meeting, Seattle, WA.

Leonard, E.N., V.R. Mattson, D.A. Benoit and G.T. Ankley. 1991. Seasonal variation of acid volatile sulfide in sediments from three northeastern Minnesota lakes. 12th Annual SETAC Meeting, Seattle, WA.

Mahony, J.D., D.M. DiToro, A.M. Gonzalez, D.J. Hansen, W.J. Berry and G.T. Ankley. 1991. A sediment component in addition to acid volatile sulfide that may further control the toxicity of metals. 12th Annual SETAC Meeting, Seattle, WA.

Mattson, V.R., E.N. Leonard, C.W. West, G.T. Ankley and J.R. Dierkes. 1991. Toxicity of sediments from the Keweenaw Waterway to three species of benthic invertebrates. 12th Annual SETAC Meeting, Seattle, WA.

Phipps, G.L., G.T. Ankley, R.A. Hoke, P.A. Kosian, A.M. Cotter and J.R. Dierkes. 1991. Does equilibrium partitioning theory predict the toxicity of dieldrin to *Hyaella azteca* in laboratory spiked-sediment toxicity tests? 12th Annual SETAC Meeting, Seattle, WA.

Schubauer-Berigan, M.K., G.T. Ankley and J.R. Dierkes. 1991. Potential regulatory applications of sediment toxicity identification evaluations: Examples from case studies. 12th Annual SETAC Meeting, Seattle, WA.

Tillitt, D.E., T.J. Kubiak, G.T. Ankley and J.P. Giesy. 1991. Dioxin-like toxic potency in Forster's tern eggs from Green Bay, Lake Michigan. 12th Annual SETAC Meeting, Seattle, WA.

West, C.W., G.T. Ankley, G.L. Phipps, R.A. Hoke and M. Balcer. 1991. Toxicity testing with sediment core samples contaminated with DDT. 12th Annual SETAC Meeting, Seattle, WA.

Call, D.J., J.A. Swenson, K. Lodge, G.T. Ankley and P.M. Cook. 1992. PCBs in river sediments and their partitioning between sediment and benthic organisms. 1992 QSAR Meeting, Duluth, MN.

Lukasewycz, M.T., G.S. Peterson, G.T. Ankley and E.J. Durhan. 1992. Surfactant characterization using toxicity identification evaluation (TIE) procedures. American Chemical Society Meeting, San Francisco, CA.

Ankley, G.T., V.R. Mattson and E.N. Leonard. 1992. Bioaccumulation of metals by benthic organisms: Relationships to sediment acid volatile sulfide content and pore water metal concentrations. 13th Annual SETAC Meeting, Cincinnati, OH.

Ankley, G.T., G.J. Niemi, K.B. Lodge, H.J. Harris, D.L. Beaver, J.P. Giesy, P.D. Jones and D.E. Tillitt. 1992. Uptake of planar PCBs and 2,3,7,8-substituted PCDFs and PCDDs by birds nesting in the lower Fox River/Green Bay, WI. 13th Annual SETAC Meeting, Cincinnati, OH.

Benoit, D.A., G.L. Phipps and G.T. Ankley. 1992. A simple inexpensive mini-flow system for the automated renewal of overlying water in toxicity tests with contaminated sediments. 13th Annual SETAC Meeting, Cincinnati, OH.

Brooke, L.T., D.J. Call, S.H. Poirier, S.L. McGovern, G.T. Ankley and P.M. Cook. 1992. Gut content weight and content clearance rate for three species of benthic invertebrates. 13th Annual SETAC Meeting, Cincinnati, OH.

Call, D.J., J.A. Swenson, H.F. Corcoran, G.T. Ankley, P.M. Cook and A.R. Carlson. 1992. Laboratory and field comparative study of PCB bioaccumulation from freshwater sediments by oligochaetes and fishes. 13th Annual SETAC Meeting, Cincinnati, OH.

Collyard, S.A., T.A. Goldenstein, R.A. Hoke and G.T. Ankley. 1992. Age sensitivity of *Hyaella azteca* to selected chemicals. 13th Annual SETAC Meeting, Cincinnati, OH.

Hoke, R.A., J.F. Peters and G.T. Ankley. 1992. Development of a sediment quality database for the Great Lakes. 13th Annual SETAC Meeting, Cincinnati, OH.

Kosian, P.A. R.A. Hike, F.M. VanderMeiden and G.T. Ankley. 1992. Determination of dieldrin sorption to colloidal and dissolved organic material in sediment porewater using a reverse-phase separation technique. 13th Annual SETAC Meeting, Cincinnati, OH.

Schubauer-Berigan, M.K., G.T. Ankley, C.W. West and L.A. Anderson. 1992. Toxicity of ammonia to freshwater benthic invertebrates. 13th Annual SETAC Meeting, Cincinnati, OH.

Schubauer-Berigan, M.K., G.T. Ankley and L.A. Anderson. 1992. Adding EDTA to bulk sediments as a confirmation tool in toxicity identification evaluations with metal-contaminated sediments. 13th Annual SETAC Meeting, Cincinnati, OH.

West, C.W., G.L. Phipps, G.T. ANKLEY, T. Goldenstein, F.M. VanderMeiden, R. Hoke, M. Balcer and T. Askergaard. 1993. Toxicity assessment of contaminated sediment using core samples and how it relates to other means of assessment. 1st International Specialized Conference on Contaminated Aquatic Sediments: Historical Records, Environmental Impact, and Remediation, Milwaukee, WI.

Ankley, G.T., D.A. Benoit, J.C. Balogh, T.B. Reynoldson, K.E. Day and R.A. Hoke. 1993. Influence of natural physico-chemical properties of sediments on toxicity test results with three freshwater benthic invertebrates. 14th Annual SETAC Meeting, Houston, TX.

Ankley, G.T., P.M. Cook, D.J. Call and R.A. Hoke. 1993. Bioaccumulation of organochlorines from sediments by oligochaetes and fishes: Comparison of laboratory and field studies. 14th Annual SETAC Meeting, Houston, TX.

Benoit, D.A. and G.T. Ankley. 1993. Methods for conducting life-cycle chronic sediment toxicity tests with *Chironomus tentans* using the newly developed sediment testing intermittent renewal (STIR) system. 14th Annual SETAC Meeting, Houston, TX.

Berry, W.J., D.J. Hansen, R.C. Swartz, G.T. Ankley and R.A. Hoke. 1993. Forgotten value of equilibrium partitioning (EqP) in predicting chemical-specific sediment toxicity from aquatic toxicity test data. 14th Annual SETAC Meeting, Houston, TX.

Brunson, E.L., G.T. Ankley, G.A. Burton, F.J. Dwyer, C.G. Ingersoll, P.F. Landrum, H. Lee and G.L. Phipps. 1993. Bioaccumulation kinetics and field-validation of whole sediment exposures with the oligochaete *Lumbriculus variegatus*. 14th Annual SETAC Meeting, Houston, TX.

Burton, G.A., G.T. Ankley, C.G. Ingersoll, T.J. Norberg-King and P.V. Winger. 1993. Evaluation of sediment toxicity test methods: Round-robin testing design. 14th Annual SETAC Meeting, Houston, TX.

Burton, G., K. Jacher, C. Rowland, G. Ankley, D. Benoit, T. Norberg-King, D. Call, T. Dawson, K. Day, J. Dwyer, I. Greer, C. Ingersoll, D. England, P. Kennedy, J. Kubitz, J. Giesy, J. Lazorchak, M. Smith, B. Suedel, M. Stinson and P. Winger. 1993. Round-robin testing of the proposed USEPA sediment toxicity test methods. 14th Annual SETAC Meeting, Houston, TX.

Call, D.J., L.T. Brooke, G.T. Ankley, D.A. Benoit, T. Norberg-King and R.A. Hoke. 1993. Protocols for conducting toxicity tests with sediment elutriates and toxicity/bioaccumulation tests with solid phase sediments. 14th Annual SETAC Meeting, Houston, TX.

Collyard, S.A. and G.T. Ankley. 1993. Use of a metabolic blocker to assess the metabolism of organophosphate insecticides by aquatic macroinvertebrates. 14th Annual SETAC Meeting, Houston, TX.

Cox, J.S., D.J. Call, M.K. Kahl, P.A. Kosian, G.T. Ankley and R.A. Hoke. 1993. Organic carbon partitioning as a basis for predicting the toxicity of chlorpyrifos in sediments. 14th Annual SETAC Meeting, Houston, TX.

Giesy, J.P., R. Crawford, P.D. Jones, D.E. Tillitt, G.T. Ankley, J.L. Newsted, L.L. Williams and D.A. Verbrugge. 1993. Accumulation and disposition of dietary 2,3,7,8-tetrachlorodibenzo-p-dioxin by rainbow trout. 14th Annual SETAC Meeting, Houston, TX.

Giesy, J.P., R. Crawford, P.D. Jones, D.E. Tillitt, G.T. Ankley, J.L. Newsted, L.L. Williams and D.A. Verbrugge. 1993. Effects of dietary 2,3,7,8-tetrachlorodibenzo-p-dioxin on the survival, growth, reproduction, histology, biochemistry and hematology of rainbow trout. 14th Annual SETAC Meeting, Houston, TX.

Hoke, R.A., G.T. Ankley, D.A. Benoit, E.N. Leonard, C.W. West, G.L. Phipps and V.R. Mattson. 1993. Sediment toxicity test method development: Effects of flow rate and feeding on water quality and exposure conditions. 14th Annual SETAC Meeting, Houston, TX.

Hoke, R.A., G.T. Ankley and J.F. Peters. 1993. Comparison of sediment quality criteria based on laboratory and field effects on benthic macroinvertebrates. 14th Annual SETAC Meeting, Houston, TX.

Ingersoll, C.G., G.T. Ankley, D.A. Benoit, G.A. Burton, F.J. Dwyer, I.E. Greer, T.J. Norberg-King and P.W. Winger. 1993. Standardization of national USEPA methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates. 14th Annual SETAC Meeting, Houston, TX.

Kukanich, D.R., G.T. Ankley and P.D. Monson. 1993. Comparison between two substrates for culturing *Chironomus tentans*. 14th Annual SETAC Meeting, Houston, TX.

Larsen, C.P., M.E. McDonald, G.J. Niemi, J.W. Nichols and G.T. Ankley. 1993. Tree swallows (*Tachycineta bicolor*) as a sentinel for local sediment contamination: Bioenergetics-based modeling of PCB accumulation by nesting tree swallows from Saginaw Bay, Michigan. 14th SETAC Annual Meeting, Houston, TX.

Monson, P.D., M.K. Schubauer-Berigan and G.T. Ankley. 1993. Interactive effects of hardness and pH on toxicity of ammonia to *Hyalella azteca*. 14th Annual SETAC Meeting, Houston, TX.

Norberg-King, T.J., G.T. Ankley, C.G. Ingersoll, G.A. Burton, R.A. Hoke, J. Kubitz and P.F. Landrum. 1993. Choosing species and methods for standardized tests with freshwater sediments. 14th Annual SETAC, Houston, TX.

Phipps, G.L., V.R. Mattson, G.T. Ankley, C.W. West, D.A. Benoit, E.N. Leonard, R.A. Hoke and P.A. Kosian. 1993. *Chironomus tentans*, *Hyalella azteca* and *Lumbriculus variegatus* as indicators of sediment toxicity to freshwater species. 14th Annual SETAC Meeting, Houston, TX.

VanderMeiden, F.M., P.A. Kosian, G.T. Ankley, G.L. Phipps and R.A. Hoke. 1993. Use of a shell-coating technique to introduce non-polar organic compounds into uncontaminated sediment. 14th Annual SETAC Meeting, Houston, TX.

Winger, P.V., P.J. Lasier, G.T. Ankley, S.A. Collyard and R.A. Hoke. 1993. Age and size of *Hyalella azteca* for sediment toxicity testing. 14th Annual SETAC Meeting, Houston, TX.

Ingersoll, C.G., G.T. Ankley, D.A. Benoit, G.A. Burton, F.J. Dwyer, I.E. Greer, T.J. Norberg-King and P.V. Winger. 1993. Standardization of national USEPA methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates. 6th International Symposium on Interactions Between Sediments and Water. Santa Barbara, CA.

Dwyer, F.J., G.T. Ankley, D.A. Benoit, E.L. Brunson, G.A. Burton, I.E. Greer, R.A. Hoke, C.G. Ingersoll, T.J. Norberg-King and P.V. Winger. 1994. USEPAs methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates. 4th Symposium Toxicology and Risk Assessment: Transboundary Issues in Pollution-Air, Surface and Groundwater, Montreal, Quebec, Canada.

Ankley, G.T. and M.K. Schubauer-Berigan. 1994. An overview of the application of toxicity identification evaluation procedures to contaminated sediments. 1st International Symposium on Sediment Quality Assessment, Goteborg, Sweden.

Ankley, G.T., P.D. Monson, P.A. Kosian and S.A. Collyard. 1994. Influence of ultraviolet light on the toxicity of sediments contaminated with polycyclic aromatic hydrocarbons. 15th Annual SETAC Meeting, Denver, CO.

Ankley, G.T., G.L. Phipps, V.R. Mattson, R.J. Erickson, P.A. Kosian, J.S. Cox, B.R. Sheedy and D.R. Mount. 1994. Phototoxicity of polycyclic aromatic hydrocarbons at varying light intensities. 15th Annual SETAC Meeting, Denver, CO.

Ankley, G.T., M.K. Schubauer-Berigan and P.D. Monson. 1994. Comparison of techniques for the isolation of sediment pore water for toxicity testing. 15th Annual SETAC Meeting, Denver, CO.

Bell, H.E., K. Liber, D. Call and G.T. Ankley. 1994. Bioavailability and photoinduced toxicity of sediment-associated fluoranthene to *Chironomus tentans*. 15th Annual SETAC Meeting, Denver, CO.

Benoit, D.A., J.L. Juenemann and G.T. Ankley. 1994. Development of a life-cycle chronic sediment test method for *Chironomus tentans*. 15th Annual SETAC Meeting, Denver, CO.

Collyard, S.A., D.L. DeFoe and G.T. Ankley. 1994. Growth as an endpoint in 10 day bulk sediment tests with *Hyalella azteca*. 15th Annual SETAC Meeting, Denver, CO.

Cook, P., R. Erickson, R. Spehar, S. Bradbury, G. Ankley and L. Burkhard. 1994. Methods for aquatic ecological risk assessments of 2,3,7,8-TCDD and related chemicals. 15th Annual SETAC Meeting, Denver, CO.

DeFoe, D.L. and G.T. Ankley. 1994. Effects of storage time on the toxicity of sediments to benthic invertebrates. 15th Annual SETAC Meeting, Denver, CO.

Hoke, R.A. and G.T. Ankley. 1994. Identification of compounds of concern in freshwater sediments. 15th Annual SETAC Meeting, Denver, CO.

Leonard, E.N., V.R. Mattson and G.T. Ankley. 1994. Horizon-specific oxidation of acid volatile sulfide (AVS) in relation to the toxicity of cadmium spiked into a freshwater sediment. 15th Annual SETAC Meeting, Denver, CO.

Liber, D. D. Call, T. Markee, K. Schmude and G.T. Ankley. 1994. Seasonal relations between acid volatile sulfide concentrations and toxicity of zinc to benthic macroinvertebrates. 15th Annual SETAC Meeting, Denver, CO.

Mattson, V.R., G.L. Phipps, G.T. Ankley, P.A. Kosian, B.R. Sheedy and J.S. Cox. 1994. Uptake and depuration of polycyclic aromatic hydrocarbons by the oligochaete *Lumbriculus variegatus*. 15th Annual SETAC Meeting, Denver, CO.

Mekenyan, O., G. Ankley, G. Veith and D. Call. 1994. QSARs for photoinduced toxicity of polycyclic aromatic hydrocarbons. 15th Annual SETAC Meeting, Denver, CO.

Peterson, G.S., M.G. Henry, G.T. Ankley, E.N. Leonard and K.M. Lott. 1994. Effects of bioturbation on sediment acid volatile sulfide and trace metal distribution. 15th Annual SETAC Meeting, Denver, CO.

Phipps, G.L., V.R. Mattson and G.T. Ankley. 1994. A simple inexpensive variable intensity UV chamber for studies of the photoactivation of toxicants. 15th Annual SETAC Meeting, Denver, CO.

Sheedy, B.R., L.J. Heinis, M.L. Knuth and G.T. Ankley. 1994. Determination of 4-nonylphenol concentrations in sediment from a littoral enclosure study. 15th Annual SETAC Meeting, Denver, CO.

West, C.W., G.T. Ankley, G.E. Elonen, G.L. Phipps, J.D. Fernandez, J.J. Libel and D. Nessa. 1994. Toxicity and bioaccumulation of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) by *Chironomus tentans* and *Lumbriculus variegatus*. 15th Annual SETAC Meeting, Denver, CO.

Whiteman, F.W., M.D. Kahl, D.M. Rau, M.D. Balcer and G.T. Ankley. 1994. Toxicity of ammonia in pore water and in the water column to three species of freshwater benthic invertebrates. 15th Annual SETAC Meeting, Denver, CO.

Mekenyan, O.G., G.T. Ankley, G.D. Veith and D.J. Call. 1994. Photoinduced toxicity of PAHs: QSAR models and environmental significance. 14th International CODATA Conference, Chambéry, France.

Ankley, G.T., O.G. Mekenyan, P.A. Kosian, D.J. Call and E.A. Makynen. 1995. Identification of phototoxic polycyclic hydrocarbons in sediments through sample fractionation and QSAR analysis. 15th International Symposium on Polycyclic Aromatic Hydrocarbons, Belgirate, Italy.

Berry, W., D. Hanse, W. Boothman, C. Pesch, D. Robson, J. Mahony, D. Di Toro, G. Ankley, D. Ma and Q Yan. 1995. Predicting the toxicity of metals-contaminated field sediments using interstitial water metal and acid volatile sulfide normalizations. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Hoke, R., E. Leonard and G. Ankley. 1995. Evaluation of proposed sediment quality criteria for metals in marine and freshwater surficial sediments. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Hoke, R., G. Ankley, G. Phipps, P. Kosian, A. Cotter, F. VanderMeiden, J. Cox and M. Balcer. 1995. Equilibrium partitioning based laboratory and field assessment of DDT impacts in freshwater sediments. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Ingersoll, C.G., F.J. Dwyer, G.T. Ankley, D.A. Benoit, T.J. Norberg-King, R.C. Swartz, K.J. Scott, K.E. Day, R. Scroggins and D.J. McLeay. 1995. Harmonization of standard toxicity test methods used in North America. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Kosian, P.A., E.A. Makynen, G.T. Ankley and P.D. Monson. 1995. Development of a toxicity-based fractionation approach for the identification of phototoxic PAHs in pore water. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Monson, P.D., B.R. Sheedy, J.S. Cox, P.A. Kosian and G.T. Ankley. 1995. Phototoxicity of three PAHs to *Chironomus tentans* in the presence and absence of a metabolic inhibitor. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Mount, D.R., C.E. Henke, C.G. Ingersoll, G.T. Ankley, T.J. Norberg-King and C.W. West. 1995. Development of toxicant identification procedures for solid phase sediment toxicity tests. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Sheedy, B.R., G.T. Ankley, J.S. Cox, P.A. Kosian, V.R. Mattson and P.D. Monson. 1995. Micro-scale analysis for the determination of PAHs in benthic macroinvertebrates. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Sibley, P.K., D.A. Benoit and G.T. Ankley. 1995. Particle size as a modifying factor in sediment toxicity tests: Effects on growth, reproduction and behavior in *Chironomus tentans*. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Sibley, P.K., D.A. Benoit and G.T. Ankley. 1995. The significance of growth in *Chironomus tentans* sediment toxicity tests: Relationship to reproduction and demographic endpoints. Society of Environmental Toxicology and Chemistry Second World Congress, Vancouver, BC.

Mount, D.R. and G.T. Ankley. 1996. Evaluating hazards of PAH-contaminated sediments to aquatic organisms. 11th Annual Conference on Contaminated Soils, Amherst, MA.

Ankley, G.T. 1996. Are increases in UV light a plausible factor contributing to amphibian deformities? 3rd Annual Meeting of the North American Amphibian Monitoring Program, Internet Meeting, [www.im.nbs.gov/naamp3.html](http://www.im.nbs.gov/naamp3.html).

Ankley, G.T. 1996. Development of a research strategy for assessing the ecological risk of endocrine disruptors. 17th Annual SETAC Meeting, Washington, DC.

Bradbury, S.P., G.T. Ankley and O.G. Mekenyan. 1996. Quantitative structure-activity relationships for polychlorinated hydroxybiphenyl estrogen receptor binding affinity: An assessment of conformer flexibility. 17th Annual SETAC Meeting, Washington, DC.

Call, D.J., T.P. Markee, K. Lodge, P.M. Cook and G.T. Ankley. 1996. Organic carbon and chemical contaminant relationships in river and lake sediments. 17th Annual SETAC Meeting, Washington, DC.

DeFoe, D.L. and G.T. Ankley. 1996. Influence of storage time on the toxicity of sediments to freshwater benthic invertebrates. 17th Annual SETAC Meeting, Washington, DC.

Erickson, R.J., G.T. Ankley, B.R. Sheedy, P.A. Kosian, V.R. Mattson, J.S. Cox and D.L. DeFoe. 1996. Evaluation of models for predicting the phototoxicity potency of polycyclic aromatic hydrocarbons. 17th Annual SETAC Meeting, Washington, DC.

Kahl, M.D., G.T. Ankley, P.A. Kosian and E.A. Makynen. 1996. Toxicity of p-nonylphenol in a life-cycle test with the freshwater macroinvertebrate, *Chironomus tentans*. 17th Annual SETAC Meeting, Washington, DC.

Larsen, C., G. Niemi, M. McDonald, D. Beaver, J. Nichols and G. Ankley. 1996. Tree swallows as a wildlife sentinel species for contaminated sediments: An example from Saginaw, Michigan. 17th Annual SETAC Meeting, Washington, DC.

Mount, D.R. and G.T. Ankley. 1996. The role of TIE in evaluating sediment toxicity. 17th Annual SETAC Meeting, Washington, DC.

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Sibley, P.K., G.T. Ankley, A.M. Cotter and E.N. Leonard. 1996. Chronic toxicity of zinc-spiked sediments: Evaluation of the acid volatile sulfide model using *Chironomus tentans*. 17th Annual SETAC Meeting, Washington, DC.

Sibley, P.K., P.D. Monson and G.T. Ankley. 1996. Ingested sediment: A potentially important source of error in toxicity assessment of contaminated sediments. 17th Annual SETAC Meeting, Washington, DC.

West, C.W. and G.T. Ankley. 1996. A laboratory sediment colonization test using the freshwater oligochaete *Lumbriculus variegatus*. 17th Annual SETAC Meeting, Washington, DC.

Ankley, G.T. 1997. Assessing the risk of environmental endocrine disruptors: An overview of activities of the Office of Research and Development of the U.S. Environmental Protection Agency. 7th Annual Meeting of SETAC-Europe, Amsterdam, The Netherlands.

Sibley, P.K. and G.T. Ankley. 1997. Assessing reproduction in the *Chironomus tentans* life cycle test: The importance of male health in determining reproductive success of females. Annual ASTM Meeting, St. Louis, MO.

Ankley, G.T., T. Colborn, S. McMaster, E. Mahaich, R. Miller, R. Stahl and D. Tillitt. 1997. Screening methods for endocrine disruptors in wildlife: Overview of a workshop sponsored by CMA, EPA and the WWF. 18th Annual SETAC Meeting, San Francisco, CA.

Bell, H., K. Liber, D. Call and G. Ankley. 1997. Bioaccumulation and photoinduced toxicity of fluoranthene at different lifestages of *Chironomus tentans*. 18th Annual SETAC Meeting, San Francisco, CA.



Benoit, D.A., P.K. Sibley and G.T. Ankley. 1997. Application of EPA's *Chironomus tentans* life cycle test and use in predicting effects of stressors on population dynamics. 18th Annual SETAC Meeting, San Francisco, CA.

Bradbury, S., O. Mekenyan and G. Ankley. 1997. Incorporating conformational flexibility in structure activity relationships for ligand binding to steroid hormone receptors. 18th Annual SETAC Meeting, San Francisco, CA.

Diamond, S., L.P. Burkhard, D.R. Mount and G.T. Ankley. 1997. Fluorescence spectra as predictors of PAH phototoxicity. 18th Annual SETAC Meeting, San Francisco, CA.

Di Toro, D. and G. Ankley. 1997. Critical role of bioavailability in developing technically defensible sediment quality criteria for metals. 18th Annual SETAC Meeting, San Francisco, CA.

Jensen, K., M. Pasha, M. Kahl, J. Tietge, A. Linnam and G. Ankley. 1997. Characterization and use of a small-fish model to assess reproductive toxicity of endocrine-disrupting chemicals. 18th Annual SETAC Meeting, San Francisco, CA.

Kahl, M., K. Jensen, E. Makynen, P. Kosian and G. Ankley. 1997. Effects of the anti-androgen vinclozolin on fathead minnow adults and embryological development. 18th Annual SETAC Meeting, San Francisco, CA.

Kosian, P., C. West, M. Pasha, J. Cox and G. Ankley. 1997. Use of carbonaceous resin for the reduction of fluoranthene concentrations in water and sediment pore water. 18th Annual SETAC Meeting, San Francisco, CA.

Mount, D.R., G.T. Ankley, S.A. Diamond, R.J. Erickson, P.K. Sibley, L.P. Burkhard and P.M. Cook. 1997. Development of toxicological models to assess the ecological risk from photoactivated toxicity of PAH. 18th Annual SETAC Meeting, San Francisco, CA.

Pasha, M.S., M. Tapper, P. Schmieder and G. Ankley. 1997. Development of a novel bioassay for identifying estrogen receptor ligands in fish. 18th Annual SETAC Meeting, San Francisco, CA.

Sibley, P.K., G.T. Ankley and D.R. Mount. 1997. Comparative sensitivity of several aquatic invertebrates to UV-light following exposure to fluoranthene-spiked sediment. 18th Annual SETAC Meeting, San Francisco, CA.

Sibley, P.K., D.A. Benoit, M.D. Balcer, G.L. Phipps, C.W. West, R.A. Hoke and G.T. Ankley. 1997. Design and testing of a bioassay chamber for *in situ* assessments of sediment toxicity using benthic invertebrates. 18th Annual SETAC Meeting, San Francisco, CA.

West, C.W., P. Kosian, L. Makynen, M. Pasha, P. Sibley, D. Mount and G. Ankley. 1997. Treatment of PAH-contaminated sediments with a carbonaceous absorbent. 18th Annual SETAC Meeting, San Francisco, CA.

Ankley, G.T., J.E. Tietge, D.L. DeFoe, K.M. Jensen, G.W. Holcombe, E.J. Durhan and S.A. Diamond. 1998. Effects of methoprene and UV light on survival and development of *Rana pipiens*. Midwest Declining Amphibians Conference, Milwaukee, WI.

Mekenyan, O., S. Karabunarliev, N. Nikolova, S. Bradbury, G. Ankley and B. Hansen. 1998. New developments in a hazard identification algorithm for hormone receptor ligands: COREPA-C. 8th International Workshop on Quantitative Structure-Activity Relationships (QSARs) in Environmental Sciences, Baltimore, MD.

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